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(19) French Republic

**NATIONAL INSTITUTE OF INTELLECTUAL PROPERTY
PARIS**

(11) Publication No. (to be used only to order copies): 2 583 729

(21) National Registration No.: 85 09758

(51) Int.Cl.⁴: **B 65 H 36/06; A 47 K 10/38**

(12) **PATENT APPLICATION**

A1

(22) Filed: June 20, 1985

(30) Priority:

(43) Date Application Made Available to the Public:

BOPI "Brevets" No. 52, December 26, 1986

(60) Reference(s) to Other Related Domestic Documents:

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(54) Simplified apparatus for simultaneous distribution and cutting of strips of coiled materials, with automatic changing of the roll in use.

(57) The apparatus is notable in that drive drum 3 incorporating the cutting member is mounted transversely in freely rotatable fashion between front and back walls 1a, 1b of housing 1, and the roll of material in use is simply set onto the drum, also being in rolling contact on a cylinder 16 that rotates with respect to said walls; the strip that is ready to be pulled projects below the apparatus after having been wound onto the drum and passed between two idler rollers 14, 15 and an opening 1e of the housing; a device 18 that is sensitive to the weight of the almost-empty roll of material pivots when said roll can pass between the drum and the rotating cylinder so as to be received in a magazine 30, and causes automatic emplacement of a fresh roll hitherto retained in the upper part of the

apparatus; a profiled member passes through the drum to coact alternately with one or the other of the front or back walls of the housing, in order to immobilize the drum after cutting and return the drum to the standby position.

The invention concerns a simplified apparatus for simultaneous distribution and cutting of strips of coiled materials, with automatic changing of the roll in use.

The subject matter of the invention pertains to the technical field of means for distributing defined lengths of strips coiled onto a spool or core. In particular, but without limitation, the invention is applicable to apparatuses for simultaneous distribution and cutting of paper, wadding, and other drying materials.

The apparatus according to the invention is of the well-known type in which the roll of material in use is applied, preferably by pressure, directly onto a drum having a non-slip surface so that, by simply manually pulling on the strip of material projecting from the apparatus, a strip whose length is substantially equal to the diameter of the drum is automatically distributed and cut, this being done by a toothed cutting device which is associated with the drum and protrudes outside the drum when it is caused to rotate by pulling on the material, so as to penetrate into the material thus stretched on either side of the cutting device. After cutting, the drum that has been extended returns to its initial position by way of complementary members, and a new strip of material projects from the apparatus.

In certain applications for this type of apparatus, it is necessary to install apparatuses having a shallow depth which distribute narrow strips from large-diameter rolls and allow automatic roll changing.

To meet these requirements, a novel apparatus for simultaneous cutting and distribution has been created, based on the drive drum with a non-slip surface, in which the cutting member is displaced as indicated above.

According to the invention, the drive drum incorporating the cutting member is mounted transversely in freely rotatable fashion between the front and back walls of the housing, and the roll of material in use is simply set onto the drum, also being in rolling contact on a cylinder that rotates with respect to said walls; the strip that is ready to be pulled projects below the apparatus after having been wound onto the drum and passed between two idler rollers and an opening of the housing; a device that is sensitive to the weight of the almost-empty roll of material pivots when said roll can pass between the

drum and the rotating cylinder so as to be received in a magazine, causing automatic emplacement of a fresh roll hitherto retained in the upper part of the apparatus; a profiled member passes through the drum to coact alternately with one or the other of the front or back walls of the housing, in order to immobilize the drum after cutting and return the drum to the standby position.

These and other characteristics will be evident from the description that follows.

To establish the subject matter of the invention without, however, limiting it, in the appended drawings:

FIG. 1 is a perspective view illustrating the device according to the present invention with the cover open;

FIGS. 2 and 3 are views showing respectively the front and back surfaces of the apparatus;

FIG. 4 is a cross-sectional view along line 4-4 of FIG. 5;

FIG. 5 is a plan view sectioned along line 5-5 of FIG. 4;

FIG. 6 is a view in section along line 6-6 of FIG. 4, showing the back surface of the drum;

FIG. 7 is a plan view sectioned along line 7-7 of FIG. 6, illustrating the drum immobilization phase after cutting;

FIG. 8 is a view in section along line 8-8 of FIG. 4, showing the front surface of the drum;

FIG. 9 is a plan view sectioned along line 9-9 of FIG. 8;

FIG. 10 is a partial view looking in the direction of arrow F of FIG. 8.

To exemplify the subject matter of the invention, it will now be described in terms of the non-limiting implementations illustrated in the drawings.

The apparatus illustrated in particular in FIG. 1 comprises a wall housing (1) constituted, for example, by a complete back wall (1a) having wall mounting means, and a front wall (1b) limited at the lower part by two side walls (1c) and a bottom, the entirety being closed by a locking cover (2).

Mounted below the bottom (1d), in freely rotatable fashion between the front and back walls, is a drum (3) of diameter (D) embodied in several assembled parts so as to constitute a casing (3a) and two flanges (3b, 3c). An opening (3d) is provided in the casing to allow passage of a toothed cutting blade (4) carried in freely rotatable fashion at (5) on the flanges by a bracket-shaped blade holder (4a) whose median or bracket-angle portion carries, on the side facing the rear flange (3b), a profiled protrusion (4b) which passes through said flange through a circular-arc opening (3c) and rests on a cam (6) secured on the wall (1a) in radially adjustable fashion with respect to the rotation axis (3e) of the drum (FIG. 6).

At the opposite end, the drum comprises a shaft (3f) that passes through the front wall (1b) of the housing and receives at the end an actuation knob (7).

Arranged inside the drum and parallel to the rotation axis is a bar (8) whose length is slightly greater than that of the drum, so that in an operating position, the end (8a) of the bar rests in an opening (3g) of the flange (3c) and does not extend outward, while the other end (8b) passes through an opening (3h) of the flange (3b) and extends to a point close to the back wall (1a) of the housing (FIG. 5).

As explained below, in another operating phase it is the end (8a) that projects outward from the drum while the end (8b) is retracted, in order to coact alternately with a stop (9) integral with the back wall (1a) or with a ramp (10) integral with the front wall (1b).

In these operating phases, the bar (8) also coacts by way of a protrusion (8c) with a stop (11) located inside the drum, and a suitably arranged spring (12) returns the bar to the stop position.

As regards the drum (3), it is also apparent that it has at the center a peripheral slot (3i) to accommodate a belt (13) that is wound in a slot (14a) established at the center of a lower roller (14) carried in freely rotatable fashion by the front and back walls of the housing. Another similar roller (15) is installed in the same fashion alongside the first, leaving between them a space sufficient for passage of the material to be distributed but too small for accidental insertion of the user's fingers, in order to prevent any contact between them and the cutting blade as it rotates. The rollers (14, 15) are preferably mounted so as to protrude slightly into the opening (1e) at the bottom of the housing to allow manual actuation if necessary.

The first roll (R1) of material to be dispensed is simply placed onto a cradle made up of three elements: the drum (3), a rotating cylinder (16) carried in freely rotatable fashion on the front and back walls of the housing, and a deflector (17) integral with a side wall (1c) of the housing.

Arranged in front of the cylinder (16) is a paddle (18) whose end arms (18a, 18b) are articulated at (19) on the front and back walls of the housing near the cylinder rotation shaft, while the median part (18c) extends toward the drum. On the side toward the back wall of the housing, the arm (18b) has an oval opening (18d) which coacts with a finger (20a) carried by a vertical rod (20) that rises toward the upper part of the housing wall (1a) and is guided loosely by a shackle (21) or similar means (FIG. 3). A spring (22) connects the finger (20a) to a lower fixed point on the housing in order to return the rod (20) downward and pull the paddle (18) to its upward position, because of the eccentric position of the finger (20a) with respect to the rotation points (19) of the paddle.

In its upper part, the rod (20) has a kink (20b) in order to pass alongside a protrusion (1f) of the housing wall on which is supported a hook (23), articulated at (23b) on said wall, whose active end (23a) holds in its normal position a protruding portion (24a) shaped onto an inclined flap (24) that is articulated at its opposite end, at (25, 26), on the housing walls (FIGS. 1 and 3).

It is evident that the protruding portion (24a) of the flap passes through a circular-arc opening (1g) of the housing wall, and that a finger (24b) of the flap located close to its

upper articulation point (26) also passes through a circular-arc opening (1h) of the wall, said finger being connected to the hook (23) by a spring (27).

It will be understood that the purpose of the flap (24) is to retain in standby fashion, above the roll (R1) in use, a second roll (R2) that is wedged between said flap and a side wall (1c) of the housing.

The operation of the apparatus will now be explained with reference to the Figures.

To put the apparatus into service, the roll (R1) is placed on the drum (3), cylinder (16), and deflector (17), and the free strip is pulled out below the apparatus by actuating the drum using the knob (7) or optionally the roller (14).

Pulling on the protruding strip causes the drum to rotate in sliding fashion, since it has on its periphery a gripping surface such as emery cloth (28), for example.

During this rotation of the drum, the cutting blade (4), which is retracted inside the drum, presses with its part (4b) on the cam (6), whose profile is designed so that after passage beneath the roll (R1), the blade emerges from the drum and penetrates into the strip of material. In the maximum extended position (FIG. 2), because of the fact that the strip is stretched on either side because of the manual tension effect and the pressure of the roller on the drum combined with the rotation, the strip is detached and the drum, now released, continues its rotation, while the blade retracts back into the drum.

When the drum reaches the position in which the cutting blade is retracted and is located behind the roll of material, the bar (6), which is held by the stop (11) and the inclined spring (12) in the position in which the profiled end (8b) protrudes from the drum, presses with that end against the stop (9), as seen in FIGS. 5, 6, and 7, thus immobilizing the drum.

As a reaction resulting from the return spring (12), the bar moves (arrow a) into the passthrough opening (3h) and, because of the spring action, retracts into the drum, while the other end (8a) of the bar in turn protrudes.

The apparatus is then ready to be used again.

When another strip is pulled and the drum is made to turn, the protruding and profiled end (8a) of the bar presses against the ramp (10) of the front wall of the housing (FIGS. 8, 9, 10), and said bar is pushed back (arrow b) and returned to the position in which the end (8b) protrudes, in order to immobilize the drum after cutting.

When the roll (R1) is almost exhausted (i.e. when only a few strip lengths remain around the spindle or core (A) to be distributed), it can rest on the paddle (18) extending between the drum (3) and cylinder (16). But because the spindle's weight is not sufficient to cause the paddle to pivot, provision is made for weighting the spindle either by introducing an independent bar (29) or by using a spindle that is itself weighted. Note that this additional roll weight prevents any slippage on the drum, except during manual pulling, when the roll is mostly used up and therefore less heavy.

The weighted spindle causes pivoting of the paddle (18), which with its arm (18b) then pushes the rod (21) upward against its return spring (22).

The upper end (20b) of the rod raises the hook (23), thus releasing the flap (24) which, in response to the weight of the standby roll (R2), pivots downward along the opening (1g). The roll (R2) then replaces the roll (R1) which has dropped into a lower receptacle (30). Concurrently, the spring (22) has pulled the rod (20) back downward and the paddle (18) into an upper position, while the spring (27) also returns the flap into the position locked by the hook (23).

When the strip protruding from the roll (R1) is then once again pulled manually, the roll (R2) will be entrained by the drum (3) and two strips will then be distributed simultaneously until the roll (R1) is exhausted.

As a variant, especially if the invention is to be used to distribute wider strips, it may be advantageous to replace the device comprising the bar (8), the stops (9) and (11), the ramp (10), and the spring (12) with the arrangements known from earlier applications of which the applicant is also the patentee, in particular application no. 85.02873, i.e.

utilizing a safety catch, a ratchet, fixed or movable stops, and guide means associated with rotation of the drum, disposing them to correspond with the structure of the present invention.

The advantages are clearly evident from the description; particularly worth emphasizing are the simplification of the apparatus as compared with existing apparatuses, smooth and precise operation, automatic roll changing which increases the capacity of the apparatus, easy and quick loading of the apparatus due to the absence of any roll support, and shallow depth.

The invention is in no way limited to the particular application, or the embodiments of its various parts, that have been more specifically indicated; to the contrary, it encompasses all variants.

Claims

1. A simplified apparatus for simultaneous distribution and cutting of strips of coiled materials, with automatic changing of the roll in use, of the type in which the roll of material in use is applied, preferably by pressure, directly onto a drum having a non-slip surface, so that by simply manually pulling on the strip of material projecting from the apparatus, a strip whose length is substantially equal to the diameter of the drum is automatically distributed and cut, this being done by a toothed cutting device which is associated with the drum and protrudes outside the drum when it is caused to rotate by pulling on the material, so as to penetrate into the material thus stretched on either side of the cutting device,
the apparatus being characterized in that the drive drum (3) incorporating the cutting member (4) is mounted transversely in freely rotatable fashion between the front and back walls (1a, 1b) of the housing (1), and the roll (R1) of material in use is simply set onto the drum, also being in rolling contact on a cylinder (16) that rotates with respect to said walls; the strip that is ready to be pulled projects below the apparatus after having been wound onto the drum and passed between two idler rollers (14, 15) and an opening (1e) of the housing; a device (18) that is sensitive to the weight of the almost-empty roll of material pivots when said roll can pass between the drum and the rotating cylinder so as to be received in a magazine (30), and causes automatic emplacement of a fresh roll (R2) hitherto retained in the upper part of the apparatus; a profiled member (8) passes through the drum to coact alternately with one or the other of the front or back walls of the housing, in order to immobilize the drum after cutting and return the drum to the standby position.
2. The apparatus as defined in Claim 1, wherein the profiled member (8) is a bar (8) whose length is slightly greater than that of the drum (3) and which has one end (8a) profiled to make contact against a ramp (10) shaped on the front wall (1b) of the housing in order to push back the bar during rotation of the drum, before the blade has emerged for cutting, in order to place it in the protruding position at its other end (8b) in order to rest against a stop (9) shaped on the rear wall (1a) of the housing in order to immobilize the drum after cutting, the bar being automatically returned against a stop (11) on the inside of the drum, in

order to be in a position with its end (8b) protruding, by an inclined spring (12) inside the drum.

3. The apparatus as defined in Claim 1, wherein the device (18) sensitive to the weight of the almost-empty roll of material and causing the deployment of the second roll is a paddle mounted pivotally at (19) on the front and back walls of the housing, one of whose arms (18b) has an oblong opening (18d) coacting with a finger (20a) integral with a rod (20) guided vertically behind the back wall (1a) of the housing, the upper end of which, when the paddle (18) is pivoted downward, raises a hook (23) retaining the device supporting the standby roll (R2).
4. The apparatus as defined in Claims 1 and 3 together, wherein the device supporting the roll (R2) is a flap (24) articulated at its upper part on the housing walls and extending in inclined fashion downward to wedge the roll between it and a side wall (1c) of the housing, the flap comprising in its lower part, on the side facing the back wall (1a) of the housing, a protrusion (24a) passing through a circular-arc opening (1g) of the wall and coacting with the active part (23a) of the hook, a spring (2, 7) attached to the flap and to the hook returning the flap into the locked position after the roll (R2) has fallen.
5. The apparatus as defined in Claim 1, wherein the spindles or hubs (A) of the rolls of material are weighted directly upon manufacture or by means of an added element, to ensure entrainment of the material on the drum under all conditions without slippage, and to permit pivoting of the paddle (18) when they press thereon.